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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/600,809
Filing Date: June 20, 2003
Appellant(s): HONG ET AL.

Alex R. Sluzas
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 4, 2008 appealing from the Office action mailed July 24, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,214,466	JOEDICKE	4-2001
3,528,842	SKADULIS	9-1970
3,507,676	MCMAHON	4-1970
JP2002018358A	INE ET AL	1-2002

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5,022,897	BALCAR ET AL	6-1991
6,306,795	RYAN ET AL	10-2001
4,735,975	IWATA ET AL	4-1988

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 4-5, 7-8, 13, 14, 39, and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke (US 6,214,466)/Skadulis (US 3,528,842)/McMahon (US 3,507,676) in view of Ine et al, further in view of Balcar et al (US 5022897).

Joedicke discloses a process for producing algae resistant roofing granules, the process comprising applying to base granules a first aqueous composition (See column 3, lines 1-5) containing a major amount of aqueous **sodium silicate solution**, a kaolin clay (aluminosilicate) (See column 4, lines 31-37) and a combination of cuprous oxide and zinc sulfide, and kiln-firing the coated granules (See column 2, lines 45-65), cooling the fired coated granules and applying to the algicide bearing granules a second aqueous composition containing sodium silicate, a kaolin clay and a pigment (claimed colorant composition), and kiln-firing the colorant-coated algicide bearing granules 740-760 °F (393-404°C) (See column 4, lines 25-31) to fuse the binder (See column 3, lines 8-14).

Skadulis discloses a process for producing algae resistant roofing granules, the process comprising applying an aqueous composition containing a major amount of **aqueous sodium silicate solution** and a kaolin (aluminosilicate) (See column 4, lines 1-22) to greystone or

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nepheline syenite granules of #11 grade in a tumbling barrel type mixer, pre-drying the granules and transferring them to a rotary firing pot and firing at 950 °F (510°C) (See column 4, lines 25-31), then applying to the formed base particles an aqueous composition containing cuprous oxide followed by firing at 700 °F (371°C) to *insolubilize* the silicate coating (See column 4, lines 32-49).

McMahon discloses a process for producing algae resistant roofing granules, the process comprising applying an aqueous composition containing a major amount of **aqueous sodium silicate solution** and a kaolin (aluminosilicate) (See column 4, lines 15-44) to greystone or nepheline syenite granules (See column 3, lines 44-48) of #11 grade in a tumbling barrel type mixer, pre-drying the granules and transferring them to a rotary firing pot and firing at 950 °F (510°C) (See column 4, lines 15-34), then applying to the formed base particles an aqueous composition containing zinc oxide followed by firing at 700 °F (371°C) to *insolubilize* the silicate coating (See column 4, lines 35-52).

Each of Joedicke, Skadulis and McMahon teaches that the base particles are obtained by **crushing and screening mineral aggregates** (See Joedicke, column 2, lines 46-47; Skadulis, column 1, lines 61-62; McMahon, column 3, lines 3-4). However, Joedicke/Skadulis/McMahon fails to teach that a stone dust produced after crushing and screening is reused by granulating a mixture containing the stone dust and a binder and insolubilizing the binder (Claim 39); the mixture is formed into base particles by a forming process selected from press molding, cast molding, injection molding, extrusion, spray granulation, gel casting, pelletizing, compaction and agglomeration (Claim 4, 15).

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Ine et al teach that a fine stone powder (claimed stone dust) generated in a **crushed stone field** can be recycled to produce granules of desired grain size by mixing the fine stone powder with a lime stabilizer (a binder) and granulating the mixture by compaction and agglomeration (See P8, 12-18; Abstract). Ine et al teach that it is known in a **crushed stone field** that waste water containing *a lot of fine stone powder* is generated because the crushed stone is conventionally washed with water to separate a fine stone powder (See P2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have recycled a stone fine powder produced after crushing and screening in Joedicke/Skadulis/McMahon by mixing it with a binder and granulating the mixture by compaction and agglomeration thereby preparing granules of desirable grain size from the stone fine powder, as taught by Ine et al.

Ine et al fails to teach that instead of a lime stabilizer, an insolubilizable binder is used (Claim 39) such as a binder comprising aluminosilicate (Claim 44); wherein the binder is insolubilized by firing in a kiln at a temperature of at least 800⁰C (Claims 40, 44).

Balcar et al teach that a mineral dust comprising mixture of a glass dust (that is generated during **crushing** glass particles) (See column 3, lines 42-48) and other mineral waste dust (See column , lines 14-24) can be pelletized using a sodium silicate in a *liquid* form, i.e. an **aqueous sodium silicate solution** (claimed insolubilizable binder) (See column 8, lines 24-26) wherein the sodium silicate acts as an adhesive which binds the dust during pelletizing (See column 8, lines 32-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an aqueous sodium silicate solution as a binder instead of lime in

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Joedicke/Skadulis/McMahon in view of Ine et al with the expectation of providing the desired binding of mineral dust since Balcar et al teach that an aqueous sodium silicate solution can be used as an adhesive for binding a mineral dust. Note that sodium silicate would be *insolubilized* in a process of Joedicke/Skadulis/McMahon upon firing.

As to aluminosilicate, McMahon teaches that insolubilized *clay-sodium silicate* compositions are *commonly* used coating compositions on roofing granules (crushed minerals) (See column 3, lines 20-25). Furthermore, each of Joedicke/Skadulis/McMahon teaches that a composition containing a *major* amount of aqueous sodium **silicate** solution and kaolin (aluminos**ilicate**) binds well to crushed mineral particles.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an aqueous composition containing a major amount of sodium silicate solution and a kaolin clay (aluminosilicate) as a binder instead of lime in Joedicke/Skadulis/McMahon in view of Ine et al in view of Balcar et al with the expectation of providing the desired binding of mineral dust since each of Joedicke/Skadulis/McMahon teaches that a composition containing a *major* amount of aqueous sodium **silicate** solution and kaolin (aluminos**ilicate**) is suitable for binding to crushed mineral particles.

It is held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

As to claimed temperature and concentration range, it is held that selection of reaction parameters such as temperature and concentration is considered to obvious in the absence of showing of criticality.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant temperature and concentration parameters for insolubilizing the binder (including those of claimed invention) in cited prior art through routine experimentation in the absence of showing of criticality.

It is the Examiner's position that kiln is conventionally used for heating to temperatures of 1200 °C. It is also the Examiner's position that the prepared roofing granules have porosity within claimed range because they are prepared by a process substantially identical to that of claimed invention.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke/Skadulis/McMahon in view of Ine et al, further in view of Balcar et al, as described above, and further in view of Ryan et al (US 6306795).

Joedicke/Skadulis/McMahon in view of Ine et al, further in view of Balcar et al fails to teach that an algaeicide-forming compound is dissolved in a fluid to form a solution, the solution being drawn into the pores in the base particles by capillary action to form solution-laden particles, the solution-laden particles being subsequently treated to convert the algaeicide-forming compound to an inorganic algaeicide (Claim 9, 11, 12, 44); the algaeicide-forming compound is a soluble copper salt (Claim 10).

Ryan et al teach that cuprous oxide can be incorporated into a porous carrier material such as silica/alumina (See column 10, lines 27-28) by impregnating the porous carrier material with an aqueous solution of copper salts such as copper nitrate using e.g. well known the pore-volume impregnation (PVI) method (See column 11, lines 4-7, 22-42, 50-67), air drying and

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calcining the impregnated porous carrier material at 200 °C-540 °C to convert the copper salt to cupric oxide, cuprous oxide, or a mixture of the two (See column 12, lines 1-22).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have added copper salts such as copper nitrate in an aqueous coating composition of cited prior art instead of Cu₂O (claimed slurry) before firing at 700 °F (371°C) with the expectation of providing the desired intimate mixture of copper oxides with the porous carrier material since Ryan et al teach that cuprous oxide can be incorporated into a porous carrier material such as silica/alumina by impregnating the porous carrier material with an aqueous solution of copper salts such as copper nitrate using e.g. well known the pore-volume impregnation (PVI) method, air drying and calcining the impregnated porous carrier material at 200 °C-540 °C to convert the copper salt to cupric oxide, cuprous oxide, or a mixture of the two.

Claims 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Joedicke/Skadulis/McMahon in view of Ine et al, further in view of Balcar et al, and further in view of Iwata et al (US 4735975).

Joedicke/Skadulis/McMahon in view of Ine et al in view of Balcar et al are applied here for the same reasons as above. Obviously, the amount of algicide deposited in roofing granules of pelletized stone dust by a method of Ryan et al would depend on porosity of the granules, i.e. an amount of algicide deposited in roofing granules of pelletized stone dust can be controlled by controlling porosity of pelletized stone dust.

However, the cited prior art does not teach that porosity can be controlled by selection of the shape of the stone dust (Claims 46, 48) or by selection of the particle size distribution (Claims 47, 49) or by adjusting the ratio of stone dust and aluminosilicate (Claim 50).

Iwata et al teach that distribution and porosity of granulated powder material (See column 2, lines 43-43) may be controlled by particle size distribution of the granular material, shape of the granules and/or the amount of the binder resin (See column 3, lines 12-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have controlled porosity of pelletized stone dust in Joedicke/Skadulis/McMahon in view of Ine et al by particle size distribution of the granular material, shape of the granules and/or the amount of the binder resin, as taught by Iwata et al.

(10) Response to Argument

Applicants' arguments submitted with the Appeal Brief have been fully considered but they are not persuasive.

A. The Cited Combination of References Is Improper and Cannot Render Claims 4-5, 7-8, 13, 14 and 39-45 Obvious

1. The Secondary References Are Non-analogous Art

In making her final rejection, the Examiner reconstructs applicants' invention by agglomerating references from three different, unrelated arts. Since the two secondary references the Examiner relies upon are neither in the same field of endeavor (producing roofing granules) nor reasonably pertinent to the problem of providing long term algae resistance, her rejection is not based on the relevant prior art, and she has not made a prima facie case of obviousness. The Board should reverse her rejection for this reason. Joedicke, Skadulis and McMahon all relate to

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manufacture of roofing granules, and in particular Ine et al. relates to the art of road construction. Balcar relates to the disposal of hazardous waste. Applicants respectfully submit that one of ordinary skill in the roofing granule art would not look to the road construction or hazardous waste disposal arts to solve the problem of long term algae resistance.

The Examiner respectfully disagrees with this argument. *All* of Joedicke, Skadulis and McMahon and Ine et al and Balcar are in a **crushed stone/mineral field and/or mineral dust by-product generated in different industrial fields**: each of primary references Joedicke, Skadulis and McMahon teaches that the base particles are obtained by crushing and screening mineral aggregates (i.e. producing claimed stone dust as by-product) (See Joedicke, column 2, lines 46-47; Skadulis, column 1, lines 61-62; McMahon, column 3, lines 3-4); Ine et al is in a **crushed stone field** (See P2); Balcar is in a **crushed mineral field** (See column 3, lines 42-45) and **mineral** dust by-product in secondary aluminum smelting (See column 1, lines 15-24). It should be further noted that in contrast to Applicants argument, Ine et al is analogous art since Ine et al teach a solution of essentially the same problem addressed by appellants, i.e., recycling a stone fine powder (claimed dust) after crushing and screening to produce granules of desired grain size (See Applicants' specification, page 5, lines 25-32) by mixing the dust with a binder (See Ine et al, Abstract, P8, 12-18 and Applicants' specification, page13, lines 1-5).

Note that the Applicants' specification describes natural aggregate dust generated including quartz (glass) as by-product of quarrying, stone crushing, machining operations, and similar operations (See page 5, lines 29-32). Note that the by-product described by the Applicants' specification might be also *hazardous*. Ine et al and Balcar relate to the problem of recycling/aggragating mineral dust. Therefore, in contrast to Applicants argument, secondary

references are analogous art being in the same field and being reasonably pertinent to the particular problem of aggregating dust with which the applicant was concerned.

2. The Secondary References Relate to Different Fields of Endeavor

The present invention and the three equivalent primary references all relate to the same general field of endeavor - protective granules for roofing. As stated in the "field of the invention" section of the application on appeal, "[t]he present invention relates to asphalt roofing shingles, protective granules for such shingles, and process for making such granules and shingles" (page 1, line 10-11). In contrast, each of the two secondary relate to wholly different fields. Balcar et al., in the field of invention section, states that "[t]his invention relates to hazardous waste removal, and more particularly to removal of hazardous waste from a flowing gaseous stream, as well as neutralization of the removed waste, and to a neutralized product containing same" (col. 1, lines 6-11). The nontoxic glass particulate resulting from Balcar et al.'s process can be used for roofing granules (col. 6, lines 16- 17) as well as for many other applications. Ine et al., in the field of invention section of the machine translation relied upon by the Examiner, states that "[t]his invention performs the wet process which washes a crushed stone at a quarry, a crushed stone place, or a sand production place, it adds calcined lime, a petrification system stabilizer, etc. to the crushed stone impalpable powder (dewatering cake) collected from the waste-water-treatment process, carries out churning mixing, granulates, and it relates to the mixed selector of the crushed stone impalpable powder which secures stability while it raises the reinforcement" (paragraph [0001]). One of ordinary skill in the art seeking to make algae resistant roofing granules would not look to the art of removing hazardous waste

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from gaseous streams for guidance. Nor would he or she look to the art of stabilizing materials for use in road construction.

The Examiner respectfully disagrees with this argument for the reasons discussed above. Moreover, the Applicants' specification describes in DETAILED DESCRIPTION, "Stone dust can be employed as the source of the *mineral* particles in the process of the present invention. Stone dust is a natural aggregate produced as a by-product of quarrying, stone crushing, machining operations, and similar operations. In particular, dust from limestone, marble, syenite, diabase, greystone, quartz, slate, trap rock, and/or basalt can be used." (See page 5, 28-32). In other words, Applicants' invention relates also to any field that generates mineral dust, and recycles the dust.

As to waste-water having fine mineral particles being not in the Applicants' field, Ine et al teach that it is known in a *crushed stone field* that **waste water** containing a lot of fine stone powder is generated because *the crushed stone is conventionally washed with water* to separate a fine stone powder (See P2). In other words, stone dust is a natural aggregate produced as a by-product of quarrying, stone crushing, machining operations, and similar operations described by the Applicants' specification would also generate **waste water** containing a lot of fine stone powder.

3. The Secondary References Are Not Reasonably Pertinent To the Problem Solved by the Present Invention

Neither of the secondary references is reasonably pertinent to the problem solved by the present invention. Ine et al. discloses an apparatus for granulating stone powder using a lime stabilizer to prepare a material for constructing a road sub base. The present invention relates to

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making roofing granules which "provide durability, reflect heat and solar radiation, and protect the bituminous binder (of the roofing shingle) from environmental degradation" (specification, page 10, lines 12-15). Ine et al. is simply not reasonable pertinent. Ine et al.'s granulated stone dust is a temporary material. Lime is well known as a "non-hydraulic" cement - calcium hydroxide is not stable in water. If Ine et al.'s stone dust granules were to be used for roofing, they would disintegrate through exposure to moisture. In explaining her rejection, the Examiner mischaracterizes applicants' disclosure as teaching a solution to "problem" of recycling stone dust (Examiner's Action of July 24, 2007, page 5, first paragraph). The Examiner confuses the solution with the problem. Applicants' presently claimed invention is addressed to the "continuing need for algae- resistant roofing products having algacide leaching rates that can be controlled so that the roofing products can be tailored for specific local conditions" (specification, page 2, lines 18-20). Balcar et al. is even further removed from the problem solved by the present invention. Balcar et al. disclose an improved method of coating a filter bag in a flowing gas stream (col. 1, lines 60-62). Thus, this rejection should be reversed because the Examiner relies upon non- analogous art.

The Examiner respectfully disagrees with this argument for the reasons discussed above because Applicants repeat the same arguments over and over again. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Furthermore, the recitation of "*roofing granules*" occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. Therefore, claim language would read on process of making algae resistant particles for any kind of outdoor surfacing, walls, decks, etc., as evidenced by McMahon (See column 1, lines 13, 33-35). In other words, claim language would read on process of making algae resistant walls, decks, etc.

Problem of recycling mineral dust by-product is not problem existing only in a process for making roofing granules a common problem for all areas of industry that generate the dust.

B. The Cited Combination of References Do Not Make Out a Prima Facie Case of Obviousness with Respect to Claims 4-5, 7-8, 13, 14 and 39-45

Even were all the art relied upon by the Examiner analogous art, the combination fails to make a prima facie case of obviousness. In particular, the Examiner's rejection relies on an inaccurate reading of Balcar et al. The Examiner's understanding is that sodium silicate is used as a binder for glass dust for use in roofing granules (Office Action of July 24, 2007, page 4, second full paragraph). It is not. In Balcar et al.'s Example 2, sodium silicate powder is mixed with "D-dust" (waste soda lime glass powder) and "crusher dust" (high alumina glass dust) and the mixture is heated to drive off volatiles and then fused at 1200 degrees C for an hour, and cooled.

The Examiner respectfully disagrees with this argument. Balcar et al teach that sodium silicate is used as an adhesive for pelletizing dust (See column 8, lines 24-26).

C. The Examiner Improperly Relies Upon a Machine Translation of a Japanese Language Patent Disclosure

In making her rejection of claims 4-5, 7-8, 13, 14, and 39-45, the Examiner relies both upon the English language abstract of Japanese Patent Publication No. 2002- 018358 and the machine translation thereof provided by the Japanese Patent Office (Examiner's Action of July 24, 2007, page 4, first full paragraph). The first page of the machine translation states that "[t]his document has been translated by computer. So the translation may not reflect the original precisely." This is understatement - the translation is nearly incomprehensible. In contested matters, the Rules require that when a party relies upon a document in a foreign language, a translation into English and an affidavit attesting to the accuracy of the translation be filed with the document. 37 C.F.R. § 41.154(b). The same rule should obtain in ex parte appeals. In this case, the translation is disclaimer of accuracy. No evidentiary weight should be given to this translation for this reason. The Examiner's rejection should be reversed for this reason as well.

The Examiner respectfully disagrees with this argument. The Examiner's rejection is based mainly on Abstract which is considered to be a reliable reference source, and P1 and P2 which are comprehensible because they describe state of the art known to the Applicants.

D. The Cited Combination of References Is Improper and Cannot Render Claims 9-12 Obvious

As argued above, both Ine et al. and Balcar et al. are non-analogous art. The sixth reference that Examiner has added to try to reconstruct the applicants' invention as claimed in Claims 9-12, Ryan et al., is also non-analogous art. First, Ryan et al. relates to a different field of endeavor. In particular, according to the "Technical Field" section of this patent, Ryan et al.

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"relates to highly active supported copper based catalysts. More particularly, [Ryan et al.'s] invention is directed to mechanically stable aluminum oxide supported copper based catalysts useful, e.g., for hydration of nitrites to amides, especially for the hydration of acrylonitrile to acrylamide." This is far removed from the art of making roofing granules. Further, Ryan et al. is not reasonably pertinent to the problem being solved by the applicants. Again, the Examiner incorrectly states what that problem is, asserting that applicants are concerned with the particular problem of incorporating cuprous oxide into the pores of mineral base particles (Examiner's Action date July 27, 2007, page 6, last paragraph). Again, the Examiner has confused the solution with the problem of addressing the "continuing need for algae-resistant roofing products having algacide leaching rates that can be controlled" (specification, page 2, lines 18-20).

The Examiner respectfully disagrees with this argument. As was discussed above, the recitation of "*roofing granules*" occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. Therefore, claim language would read on a process of making of any porous inorganic particles coated with cuprous oxide or zinc oxide. Therefore, references relating to said process of coating would be relevant. Ryan et al is reasonably pertinent to the particular problem with which the applicant was concerned such as incorporating *cuprous oxide* into pores of *mineral* base particles. Therefore, Ryan et al is analogous art.

E. The Cited Combination of References Do Not Make Out a Prima Facie Case of Obviousness with Respect to Claims 9-12

As in the case of the first rejection entered under Section 103(a), even if all the art relied upon by the Examiner were actually analogous art, the combination proposed by the Examiner fails to make a prima facie case of obviousness. This rejection also relies on an inaccurate reading of Balcar et al., namely that sodium silicate is used as a binder for glass dust for use in roofing granules (Office Action of July 24, 2007, page 4, second full paragraph). The addition of Ryan et al. to the five other references cited by the Examiner does not help render the present invention obvious. Ryan et al. teach a process for reducing the leaching of copper from porous aluminum oxide catalysts in comparison with conventional catalysts (col. 20, lines 16-20). It is not clear how Ryan et al. could possibly be combined with Balcar et al., since the two have what appear to be mutually contradictory goals. Balcar et al. seeks to insolubilize heavy metal contaminants in a glassy matrix, while Ryan et al. would like to provide an improved catalyst which permits contact between the catalytic copper metal or metal oxide and the catalysate. Ryan et al. does not suggest that a sodium silicate binder be used for any purpose. The Examiner has failed to make out a prima facie case of obviousness with respect to Claim 9-12, and this rejection should be reversed for this reason.

The Examiner respectfully disagrees with this argument. According to MPEP, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation in the references themselves to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable

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expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

All of Joedicke, Skadulis and McMahon and Ine et al are in a **crushed stone field**. Each of primary references Joedicke, Skadulis and McMahon teaches that the base particles are obtained by crushing and screening **mineral** aggregates (i.e. producing claimed stone dust as by-product) (See Joedicke, column 2, lines 46-47; Skadulis, column 1, lines 61-62; McMahon, column 3, lines 3-4). Ine et al is a secondary reference which was applied to show that a stone fine powder after crushing and screening can be recycled to produce granules of desired grain size by mixing the stone powder with a lime stabilizer (a binder) and granulating the mixture by compaction and agglomeration (See P 8, 12-18) (See Abstract). Therefore, Ine et al would motivate one of ordinary skill in the art to *recycle* a waste by-product. However, it should be noted that even without teaching of Ine et al, the mere production of the dust by-product in Joedicke/Skadulis/McMahon would *motivate* one of ordinary skill in the art to seek methods of *recycling* the dust by-product at least to prevent the environmental pollution.

Balcar et al teach that a sodium silicate (claimed binder) (See column 7, lines 23-27) in a *liquid* form (See column 6, lines 4-7; column 8, lines 24-26) can be used as a binder for granulating a glass dust (See column 8, line 26).

One of ordinary skill in the art would have reasonable expectation of success in recycling stone dust by-product produced after crushing and screening **mineral** aggregates in each of Joedicke, Skadulis and McMahon by granulating the stone dust using an adhesive binder, as taught by Ine. One of ordinary skill in the art would have reasonable expectation of success in

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using a sodium silicate of Balcar et al instead of lime of Ine because Balcar et al teach that a sodium silicate can be used for palletizing the dust because it binds mineral dust.

As to Ryan et al, the cited prior art fails to teach that algacide *cuprous oxide* is incorporated into base particles by dissolving *cuprous oxide* algacide-forming compound in a fluid to form a solution, drawing the solution into the pores in the base particles by capillary action to form solution-laden particles, subsequently treating the solution-laden particles to convert the algacide-forming compound to *cuprous oxide* inorganic algacide (Claim 9, 11, 12, 44); the algacide-forming compound is a soluble *copper* salt (Claim 10).

Ryan et al is a *secondary* reference which is relied upon to show that *cuprous oxide* can be incorporated into a porous carrier material such as silica/alumina (See column 10, lines 27-28) by impregnating the porous carrier material with an aqueous solution of copper salts such as copper nitrate using e.g. well known the pore-volume impregnation (PVI) method (See column 11, lines 4-7, 22-42, 50-67), air drying and calcining the impregnated porous carrier material at 200 °C-540 °C to convert the copper salt to cupric oxide, cuprous oxide, or a mixture of the two (See column 12, lines 1-22).

One of ordinary skill in the art would have reasonable expectation of success in using a method of Ryan et al to incorporate *cuprous oxide* into base particles of the cited prior art because the base particles of the cited prior art are also minerals.

Thus, the combination of cited references meets all three basic criteria as was discussed above.

F. The Examiner Improperly Relies Upon a Machine Translation in the Rejection of Claims 9-12

In making her rejection of Claims 9-12, the Examiner has improperly relied upon a machine translation which incorporates a disclaimer of accuracy, as argued above with respect to the first rejection entered under 35 U.S.C. 103(a) (Examiner's Action dated July 24, 2007, page 5, second paragraph). The rejection should be reversed for this reason as well.

The Examiner respectfully disagrees with this argument for the reasons discussed above in C.

G. The Cited Combination of References Is Improper and Cannot Render Claims 46-50 Obvious

In rejecting Claims 46-50, the Examiner relies upon the combination of Joedicke/Skadulis/McMahon, taken in view of Ine et al., taken further in view of Balcar et al., combined with yet another reference, Iwata et al. As argued above, both Ine et al. and Balcar et al. are non-analogous art. The sixth reference that Examiner has added to try to reconstruct the applicants' invention as claimed in Claims 46-50, Iwata et al., is also non-analogous art. The Examiner does not argue that Iwata et al. is within the same field of endeavor as applicants' invention, but instead contends that Iwata et al. is a secondary reference which shows that the distribution and porosity of granulated powder material may be controlled by the particle size distribution of the granular material, shape of the granules, the amount of binder resin (Examiner's Action mailed July 24, 2007, page 8, fourth paragraph). Iwata et al. relates to "a friction material" and "[m]ore particularly... to a friction material useful for a brake and having good fade resistance and wear resistance" (col. 1, lines 5-9), a field of endeavor unrelated to applicants' presently claimed invention. The Examiner's characterization of Iwata et al. is not correct. Iwata et al. is not concerned about the porosity of the granular material as argued by the

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Examiner. Iwata et al. is concerned about the porosity of the friction material used for brake pads that are made from the granular material (see, e.g. Fig. 1, col. 2, line 58 - col. 3, line 2, Examples 1-11, Tables 3-6).

The Examiner respectfully disagrees with this argument. Iwata et al is a secondary reference which is relied upon to show that distribution and porosity of granulated powder material (See column 2, lines 43-43) may be controlled by particle size distribution of the granular material, shape of the granules and/or the amount of the binder resin (See column 3, lines 12-18). It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Iwata et al et al is reasonably pertinent to the particular problem with which the applicant was concerned such as controlling porosity by selection of the shape of the stone dust (Claims 46, 48) or by selection of the particle size distribution (Claims 47, 49) or by adjusting the ratio of stone dust and aluminosilicate. Therefore, Iwata e et al is analogous art.

H. The Cited Combination of References Do Not Make Out a Prima Facie Case of Obviousness with Respect to Claims 46-50

As in the case of the first and second rejections entered under Section 103(a), even if all the art relied upon by the Examiner were actually analogous art, the combination proposed by the Examiner still fails to make a prima fade case of obviousness. The addition of Iwata et al. to the five other references cited by the Examiner does not serve to render the present invention

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obvious. Iwata et al. relates to the production of a friction material for brake pads which bind together an inorganic powder material such as iron oxide, an organic material such as rubber powder, and a fibrous material such as asbestos, with a thermoset resin. The granules themselves are not intended to be porous. Instead, the porosity is introduced into the friction material (Fig. 1). Thus, none of the references relied upon by the Examiner teach or suggest that roofing granules themselves should be porous. The cited combination of references thus does not establish a prima facie case of obviousness in respect of the presently claimed invention, as claimed by Claims 46-50.

The Examiner respectfully disagrees with this argument for the reasons discussed above. Since all three basic criteria are met, as was discussed above, the cited references make out a prima facie case of obviousness.

In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

I. The Examiner Improperly Relies Upon a Machine Translation in the Rejection of Claims 46-50

In making her rejection of Claims 46-50, the Examiner has improperly relied upon a machine translation of the Inge et al. reference which incorporates a disclaimer of accuracy, as argued above with respect to the first rejection entered under 35 USC 103(a) (Examiner's Action dated July 24, 2007, page 8, second paragraph). The rejection should be reversed for this reason as well.

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The Examiner respectfully disagrees with this argument for the reasons discussed above in C.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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